CLAIMS

1. A method for producing an exhaust gas purifying catalyst, which comprises the steps of:

preparing a pre-crystallization composition containing elementary components, the elementary components constituting a perovskite-type composite oxide containing a noble metal;

mixing the pre-crystallization composition with a powder of theta-alumina and/or alpha-alumina to prepare a mixture; and

subjecting the mixture to heat treatment.

2. The method for producing an exhaust gas purifying catalyst according to claim 1, wherein the perovskite-type composite oxide is represented by the general formula (1):

$$AB_{1-m}N_mO_3 \qquad (1)$$

wherein A represents at least one element selected from rare earth elements and alkaline earth metals; B represents at least one element selected from Al and transition elements excluding the rare earth elements and noble metals; N represents at least one noble metal; and m represents an atomic ratio of N satisfying the following relation: $0 < m < 0.5$.

3. The method for producing an exhaust gas purifying catalyst according to claim 2, wherein N in the general formula (1) is at least one selected from the group

consisting of Rh, Pd, and Pt.

4. The method for producing an exhaust gas purifying catalyst according to claim 1, wherein the perovskite-type composite oxide represented by the general formula (1) is at least one selected from the group consisting of Rh containing perovskite-type composite oxides represented by the following general formula (2), Pd containing perovskite-type composite oxides represented by the following general formula (3), and Pt containing perovskite-type composite oxides represented by the following general formula (4):

$$A_{1-p}A'_pB_{1-q}Rh_qO_3 \qquad (2)$$

wherein A represents at least one element selected from La, Nd, and Y; A' represents Ce and/or Pr; B represents at least one element selected from Fe, Mn, and Al; p represents an atomic ratio of A' satisfying the following relation: $0 \leq p < 0.5$; and q represents an atomic ratio of Rh satisfying the following relation: $0 < q \leq 0.8$,

$$AB_{1-r}Pd_rO_3 \qquad (3)$$

wherein A represents at least one element selected from La, Nd, and Y; B represents at least one element selected from Fe, Mn, and Al; and r represents an atomic ratio of Pd satisfying the following relation: $0 < r < 0.5$,

$$A_{1-s}A'_sB_{1-t-u}B'_tPt_uO_3 \qquad (4)$$

wherein A represents at least one element selected from La,

Nd, and Y; A′ represents at least one element selected from Mg, Ca, Sr, Ba, and Ag; B represents at least one element selected from Fe, Mn, and Al; B′ represents at least one element selected from Rh and Ru; s represents an atomic ratio of A′ satisfying the following relation: $0 < s \leq 0.5$; t represents an atomic ratio of B′ satisfying the following relation: $0 \leq t < 0.5$; and u represents an atomic ratio of Pt satisfying the following relation: $0 < u \leq 0.5$.

5. The method for producing an exhaust gas purifying catalyst according to claim 1, theta-alumina and/or alpha-alumina is represented by the following general formula (5):

$$(Al_{1-g}D_g)_2O_3 \qquad (5)$$

wherein D represents La and/or Ba; and g represents an atomic ratio of D satisfying the following relation: $0 \leq g \leq 0.5$.

6. The method for producing an exhaust gas purifying catalyst according to claim 1, further comprising a preparing the pre-crystallization composition by mixing a solution containing alkoxides of elementary components constituting the perovskite-type composite oxide excluding at least one noble metal with a solution containing an organometal salt of at least one noble metal.

7. The method for producing an exhaust gas purifying catalyst according to claim 6, wherein the organometal salt

of the noble metal is a noble metal complex comprising at least one of a β-diketone compound or β-ketoester compound represented by the following general formula (6) and/or a β-dicarboxylic ester compound represented by the following general formula (7):

$$R^3COCHR^5COR^4 \qquad (6)$$

wherein R^3 represents an alkyl group having 1 to 6 carbon atoms, a fluoroalkyl group having 1 to 6 carbon atoms or an aryl group; R^4 represents an alkyl group having 1 to 6 carbon atoms, a fluoroalkyl group having 1 to 6 carbon atoms, an aryl group or an alkyloxy group having 1 to 4 carbon atoms; and R^5 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms,

$$R^7CH(COOR^6)_2 \qquad (7)$$

wherein R^6 represents an alkyl group having 1 to 6 carbon atoms; and R^7 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.